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SOLID BIO-MATERIAL FOR A SENSOR THAT DETECTS BIO-ELECTRIC SIGNALS THROUGH THE USE OF THE CHARACTERISTICS AND FUNCTIONS OF BIO-EPIDERMAL TISSUES AND EPIDERMAL TISSUES OF LIVING ORGANISMS AND THE METHODS FOR PRODUCING THE SAME

TECHNICAL FIELD

The present invention discloses a solid bio-material for the detection of a bio-electromagnetic signal, which senses an information signal generated from living organisms and changes thereof by using fish scale, feathers of fowl and carapaces of tortoises among epidermal tissues of animals having the function of detecting, memorizing and transferring a weak information signal (bio-signal) of an electromagnetic field generated from bio tissues, and a method for producing the same.

BACKGROUND ART

We have known about electromagnetic signals of bio-organisms since 1 BC. According to documents, the people of that period first tried to cure migraine headaches and prolapse of the anus through the use of electric fish. However, it had not been recognized as a kind of general vital phenomenon not limited to certain species until 1786 that a German biologist, physician, and anatomist, Luigi Galvani (1737-1798) observed electric potential of bio-organisms through experiments using

potential caused by contractions of the heart muscle and to record them graphically. He coined the term, electrocardiogram for this process.

Therefore, there have been two different methods thus far for detecting bio-signal in general. The first is passively through heat and humidity of the epidermis after adding weak electricity to the exposed epidermis. The second is actively by detecting weak electricity left on the epidermis with electrode.

However, we cannot detect the smallest differences in biological signals through either of these classical methods due to environmental changes. In other words, technology, thus far, has not been able to distinguish between the ever-slight differences of biological signals of cancer cells and other disease cells.

While searching for a more efficient material to detect the differences in the biological signals of cancer cells we discovered that fish scales~~,~~ bird feathers or turtle shells react very sensitively to the biological signals.

Now, let's take a closer look at the characteristics and functions of the epidermis.

We have originally believed the epidermis to be only a dead keratin tissue layer because of its lack of blood vessels, nerve endings or lymph channels. However, as technology progressed, the epidermis was found to operate a complex organ of numerous structures (sometimes called the integumentary system) serving vital protective and other functions

against external (mechanical, chemical, and physical) offenses.

The ectoderm forms the whole of the nervous system, the epidermis of the skin, the lining cells of the sebaceous, sudoriferous, and mammary glands, the hairs and nails, the epithelium of the nose and adjacent air sinuses, and that of the cheeks and roof of the mouth. From it also are derived the enamel of the teeth, and the anterior lobe of the hypophysis cerebri, the epithelium of the cornea, conjunctiva, and lacrimal glands, and the neuro-epithelium of the sense organs.

When we take a look at a fish scale without its thin outer layer through a microscope, we can find many melanin crystalloids that have been formed by melanin cells when the epidermis has been formed by the ectoderm. These melanin crystalloids have a very complex structure and their shape is similar to that of Neuroglia Cells, namely, the Astrocyte and the Oligodendrocyte.

The epidermis that has been formed by the ectoderm, such as the keratin layer of the human skin, chitinous substance of insects, fish scale, turtle shell, and bird feather, through treatment, will be able to analyze, synthesize, memorize, learn, transform, transmit, and retransmit the electromagnetic signal spectrum of living organisms. In this way, the epidermis' function is similar to that of the human brain.

The epidermis covers the surface of the living organism with the optical medium, which is a semi-transparent, solid, intermittent multi-layer system made of keratin. This intermittent multi-layer system,

The non-linear medium, optic characteristic and multilayer system of the epidermis produce oscillation harmonic generation when the living organism like the epidermis is influenced by electromagnetic radiation.

The epidermis is very different from the other types of living organisms. The epidermis is the border between the outer and inner environments however; the epidermis is also the medium that connects the two environments together. Thus, we can refer to the epidermis of turtle shells, bird feathers, and fish scale as a "multi-information system".

The epidermis will not simply allow all types of light spectrum, from ultraviolet rays to near infrared rays, to pass through. The epidermis is very selective in what it will allow to pass through and will generate a drastic change in some areas of the spectrum. This is the result of the resonance of the epidermis.

The epidermis will absorb the radiated energy from the electromagnetic field after being stimulated. However, this is not simple absorption but a modifying procedure of the spectrum of radiated energy. From a biological point of view, this is of great significance. When the radiated spectrum is transferred to short-wave range, excess energy will be generated within the living organism. In other words, the core energy that enhances the activity of the living organism is as such produced.

epidermal layer is composed of a very solid layer system. And, in view of electrophysics, the epidermis is an insulator having 10^{12}~10^{15} ohm. However, the epidermis belongs to the bio-electret under certain conditions. In this case, the bio-electret is the dielectric substance with quasiconstant electric charges. All types of electret charges are very stable. We can observe this electret effect in the biopolymer. The epidermis, which is a biopolymer, optic multi-layer medium, and keratin thin layer, is a natural bio-electret that reacts by generating electric oscillation from the stimulation of an outer electromagnetic field.

The epidermis is a non-linear medium. Since the dielectric constant of non-linear medium is sensitive to the electromagnetic field, the epidermis exposed to a very strong electromagnetic field can generate polarization. Furthermore, this bio-electret can retain polarization even after being removed from the source of polarization.

Even−piezoelectricity has been observed on the epidermis. Its characteristics are to be authentic ferroelectrics so that the epidermis is considered "semi-stable ferroelectrics".

The ferroelectrics exposed to the very strong electromagnetic field has a different non-linear relationship of polarization according to the intensity of the outer electromagnetic field; in consequence, harmonic generation is produced in the electric current that is passed through the dielectric like the epidermis.

The epidermal thin multilayer contains keratinocyte generated

Rectification. The wave of polarization of frequency wave 2ω will be re-radiated at the same frequency wave under the proper conditions. In other words, the second optic harmonic generation of the frequency wave of 2ω is produced in the medium.

The square non-linear medium like the epidermis concentrates the wave frequency spectrum when the light wave disperses on the inside. And when the two waves react reciprocally on the standard frequency ω, the re-radiated wave of the frequency wave 2ω is generated. This is the second optic harmonics generation.

This is how the non-linear optic medium in the form of the crystalloid produces the second harmonics generation. The epidermis is a crystalloid including a melanin corpuscle.

The epidermis has a Periodic System after which the two layers next to each other can be distinguished by the different physical characteristics like the dielectric ε and this difference is transferred from one layer to the other several times.

When we examine the epidermal tissue like human keratin, fish scale or turtle shell through the microscope, we can observe hundreds of epidermal layers juxtaposed in the micron unit of periodicity.

The two epidermises next to each other in the periodic system have different optico-physical characteristics. First, the refractive values n, n', to two different dielectric constant rates ε, ε' are different. The non-

linear way the optic harmonic generation is produced is also a characteristic of the periodic medium.

The original characteristic of the periodic medium is that the condition of synchronization is modified when harmonic generation is produced. The diffraction of the harmonic generation derived from the non-linear periodic medium emphasizes the non-linear optic modifying effect. In other words, the periodic medium like the epidermis has optimal conditions for phase synchronization and harmonic generation.

The incidence angle range of the bundle of scattered light is wide enough for all types of angles for synchronization. In other words, a general type of lighting can generate phase synchronization even on the epidermal multi-layer structure of an animal.

The sun energy in range of infrared reaching the earth can influence all types of living organisms while some of this sun energy is reflected ~~on~~ the epidermis. Sometimes, the sun energy is refracted, scattered and finally absorbed on the border of the dielectric layer. The very active non-linear optic medium like the epidermis modifies and shortens the outer energy/infrared light inside of the epidermis.

When multiple monochromatic waves are diffused on the epidermis, its non-linearity generates a combined frequency. The amplitude of each combining wave defines its amplitude. Even if even one of the combining frequencies stays in the visible diapason, the combined frequency will equally remain there. Because only the first combining

signal of the living organism.

DISCLOSURE OF THE INVENTION

As we have just discussed, our invention is the manufacturing of a solid bio-material with the characteristics of the epidermis by separating the epidermal tissue from a living organism. The characteristics of the epidermis allow us to detect cancer cells by distinguishing signals between cancer cells and normal healthy cells. The characteristics of the epidermis also allow us to produce a more efficient fertilizer. Thus, the purpose of our invention is to create bio-materials for the use in the production of a bio-sensor and the process of manufacturing the bio-sensor.

BEST MODES FOR CARRYING OUT THE INVENTION

The object of our invention is a solid bio-material for the detection of a bio-electromagnetic signal by using epidermal tissues of living organisms by the method of: immersing the carcass of an animal with a developed epidermis such as fish, fowl, tortoises, etc. in a mixed solution of aromatics (fragrance), salt and water; separating the epidermis from the immersed living organism; washing the separated epidermis, soaking it in a mixed solution of potassium dichromate,

vinegar and water, and then drying it in room temperature; applying hot and cold air in turn to the dried epidermis, sterilizing the hot and cold treated epidermis by irradiating ultraviolet rays; generating static electricity; selecting areas with concentrated melanin crystalloid; cutting the epidermis into required sizes and applying pine nut oil to the outer surface. We then take these solid bio-materials for a sensor that detects bio-electric signals.

Let's take a detailed look at the methods for producing the solid bio-material for the detection of a bio-electromagnetic signal by using epidermal tissues of living organisms by: immersing the carcass of an animal with a developed epidermis such as fish, fowl, tortoises, etc. in a mixed solution of aromatics (fragrance), salt and water in the ratio of 1:2:300 for one week; the water temperature should range between 25-27°C.

The reason for the immersion is to accelerate the decomposition of the carcass that will allow for an easier separation of the epidermis and for the minimalization of scarring on the epidermis.

For maximum melanin crystalloid, the epidermis should be thick and semi-transparent. Semi-transparency is necessary for the optical function of the epidermis while the thickness will allow for an easier creation of harmonic generation energy.

The separating procedure is as follows: the immersed epidermis should be separated from the decomposed fish, fowl, tortoises, etc. by

1. The external electromagnetic spectrum can transform the epidermis, an insulator having electric resistance of 10^{12}~$10^{15}\Omega$ to a Dielectric Substance conducting polarization.

2. The keratinocyte of the epidermis causes non-linear electromagnetic polarization under the influence of electromagnetic spectrum.

3. The epidermis is the bio-electret, which can retain polarization even without the external primary source of polarization.

4. The bio-electret that has been influenced by the electromagnetic field produces Harmonic Generation due to the changes of the non-linear relationship of polarization.

As shown above, the optical, physical and electrical characteristics of the micro multilayer epidermal becomes dramatically active through our biosensor manufacturing procedure after separating from the organism.

The followings examples show specific application of the solid bio materials for the detection of bio-signal using epidermal tissues of living organism according to the present invention may be applied to the following fields.

First, in the case of the reaction of the biosensor to energy of living organisms, our solid living bio-material can detect, analyze, and synthesize the electromagnetic spectrum of living organisms that have

abnormal cells such as cancer or tumor cells. So, if we set up this solid living bio-material on the head of the probe, the solid living bio-material will detect and amplify even the smallest capacitance from the living organism. Our probe is equipped with three special circuits; the first circuit enables the probe to amplify and transform this capacitance into frequency waves; the second enables the probe to take the frequency waves and diagnose them; the third enables the probe to transform the diagnoses and translate it into digital form, which is displayed on an LCD panel.

Second, in the case of the fertilizing aspect of the solid living bio-material, it can rejuvenate soil and aid in the growth of crops and plants. For this purpose, we utilized bird feathers. The solid living bio-material treated through our procedure can revive uncultivable soil by stimulating the living organism in soil and enhancing growth of crops and plants.

In order to test for the fertilization purpose of our solid living bio-material, we sowed barley seeds in 1) soil mixed with invented solid living bio-material and 2) soil mixed with non-treated bird feather.

Note: All conditions were held constant between two soil tests and results were taken three days after disseminating seeds.

Unit: cm

	The growth rate of barley grown in soil mixed with	
	invented living organism sample (treated)	non-treated bird feathers
3 days after disseminating seeds in soil	0.2	-
4 days	4	1
5 days	6	2.4
6 days	10.1	5
7 days	14	7
8 days	18	9.5
9 days	20	13.5
10 days	20	14
11 days	19.5	14
12 days	21	14
13 days	21.75	14.5
14 days	23	15
15 days	24	16
16 days	24.5	17
17 days	25.5	17.5
18 days	26	18

19 days	27	18.5
20 days	27.5	19.5
21 days	29	20.5
22 days	30	21
23 days	30	22
24 days	32	22.5
25 days	33	24

According to the above results, we found that barley seeds strewn in soil mixed with invented living organism grew at a much faster rate than barley seed strewn in soil mixed with non-treated bird feathers.

INDUSTRIAL APPLICABILITY

This invention gives us the new biological materials in order to enhance human life. The biological materials may be used for detecting cancer or creating a revolutionary fertilizer. The new materials are made of the epidermal tissue of turtle shells, bird feathers, and fish scales, which can detect, analyze, synthesize, memorize, transform and transmit electric charges from the skin.